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Payton

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[54] **FADING-FREE OPTICAL PHASE RATE RECEIVER**

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[58] **Field of Search** 359/190, 111, 359/191, 189, 192, 162, 156; 350/349

[56] **References Cited**

U.S. PATENT DOCUMENTS

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[57] **ABSTRACT**

A method and optical system for fading-free reception of optical phase signals having temporally varying polarization, phase and phase frequency is provided. Two orthogonally polarized local oscillators light waves of different frequencies are utilized to produce optical interference with an unknown polarization state optical input signal. Square law detection of the resultant optical interference yields a composite radio frequency signal which is decoded into four electronic outputs. These outputs are temporally differentiated and cross multiplied to produce a single composite output corresponding to the phase rate of the optical input signal. The total power of the four electronic outputs is proportional to the input signal power. The present invention thus maintains constant signal to noise ratios and avoids the use of internal clippers and limiters.

15 Claims, 8 Drawing Sheets